



Conettix Plug-in Communicator Interface

B450



BOSCH

Table of contents

1	Safety	4
2	Introduction	5
2.1	About documentation	5
2.2	Bosch Security Systems, Inc. product manufacturing dates	5
2.3	Installation workflow	5
3	System overview	7
3.1	Module overview	7
3.2	Bus address settings	8
4	Installation	10
4.1	Setting the bus address	10
4.2	Insert the B44x communication module (required and available separately)	10
4.3	Mount the module in the enclosure	11
4.3.1	Mount and wire the tamper switch (option for SDI2 bus only)	12
4.4	Install and mount the plug-in communicator antenna	12
4.5	Wire to the control panel	13
4.5.1	Wire to an SDI2 control panel	14
4.5.2	Wire to an SDI control panel	15
4.5.3	Wire to an option bus control panel	16
5	Configuration	17
5.1	Plug and Play configuration	17
5.2	Configuration for SDI2 control panels	17
5.2.1	Configuring and viewing status from RPS	17
5.3	Use USB to configure the B450	22
5.3.1	Install a communication program	24
5.3.2	Log into the USB interface	25
5.3.3	USB Main menu	27
5.3.4	USB menu structure	27
5.3.5	USB menu	28
5.4	Short Message Service (SMS) configuration	32
5.4.1	Use SMS to configure the B450	32
5.5	Firmware Update page	35
6	Maintenance and troubleshooting	39
6.1	LED status indicators	39
6.2	Show the firmware version	41
6.3	Diagnostic log	41
6.4	Understanding network polling	41
6.4.1	Example 1 - High Security Application	42
6.4.2	Example 2 - Medium Security Application	42
6.4.3	Example 3 - Backup or Low Security Application	42
6.5	Control panel programming using cellular	43
7	Specifications and certifications	44
7.1	Technical specification	44
7.2	Certifications	45

1

Safety

ESD Precaution



Please note that while the B450 comes in a plastic case, and is protected from ESD, the plug-in cellular communicator (B44x) does not. All plug-in cellular communicator components may potentially be exposed to finger touches - therefore extra attention must be paid to ESD (electrostatic discharge) precaution. Make sure there is no static interference when using the board. Appropriate ESD protections must be taken and wearing electrostatic equipment is recommended, such as anti-static wrist strap.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.



Warning!

Failure to follow these instructions can result in a failure to initiate alarm conditions. Bosch Security Systems, Inc. is not responsible for improperly installed, tested, or maintained devices. Follow these instructions to avoid personal injury and damage to the equipment.



Notice!

Inform the operator and the local authority having jurisdiction (AHJ) before installing the module in an existing system.

Disconnect all power to the control panel before installing the module.

2 Introduction

2.1 About documentation

Copyright

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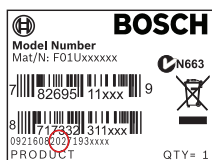
Trademarks

All hardware and software product names used in this document are likely to be registered trademarks and must be treated accordingly.

2.2 Bosch Security Systems, Inc. product manufacturing dates

Use the serial number located on the product label and refer to the Bosch Security Systems, Inc. website at <http://www.boschsecurity.com/datecodes/>.

The following image shows an example of a product label and highlights where to find the manufacturing date within the serial number.



2.3 Installation workflow

To install and configure the device, use the workflow below and follow in sequential order from top to bottom, marking off each box as you complete a step.



Caution!

Always power down the control panel when connecting the B450. Power down the control panel by unplugging the transformer and disconnecting the battery.

- ☐ Plan the installation of the B450 Conettix Plug-in Communicator Interface
- ☐ Unpack the device contents
- ☐ Power down the system
- ☐ Select the bus address value for the compatible control panel (This will automatically configure the module to work with a compatible control panel. Refer to *Setting the bus address*, page 10)
- ☐ Insert the desired plug-in communicator into the B450 (Refer to *Insert the B44x communication module (required and available separately)*, page 10)
- ☐ Mount the B450 into the enclosure (Refer to *Mount the module in the enclosure*, page 11)
- ☐ Wire the B450 to a compatible control panel (Refer to *Wire to the control panel*, page 13)
- ☐ Power up the system

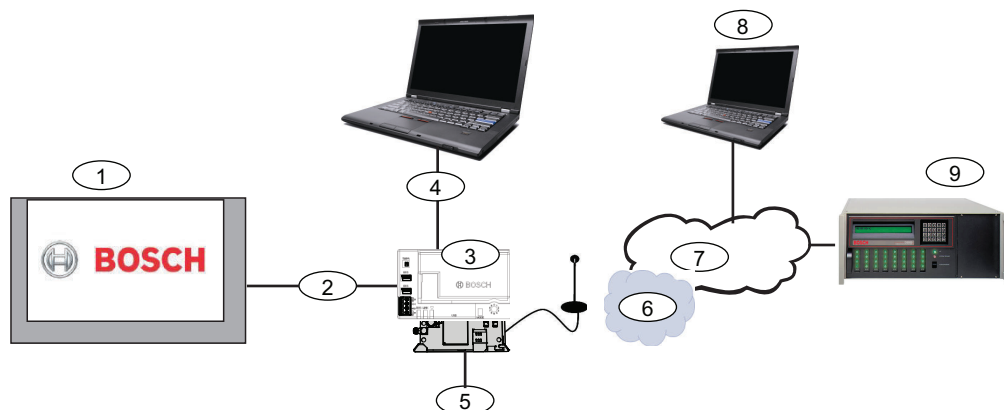
- ☐ Install a communication program (if required) (Refer to *Install a communication program*, page 24)
- ☐ Configure the communication module (non SDI2 control panels)
- ☐ Verify LED activity
- ☐ Review signal strength on the cellular communicator. Refer to your cellular communicator Installation Guide for more information on signal strength.
- ☐ Installation is complete

See also

- *Configuration*, page 17
- *Maintenance and troubleshooting*, page 39

3 System overview

Refer to the graphic below for the complete B450 system configuration.



B450 system connections overview

Callout — Description	Callout — Description
1 — Compatible Bosch control panel	6 — Cellular carrier network
2 — Panel data bus (SDI2 , SDI, or Option)	7 — Internet/LAN/WAN
3 — B450	8 — Remote Programming Workstation
4 — USB direct connection for B450 configuration (if required)	9 — Bosch Conettix IP receiver (D6600, D6100i, or D6100IPv6)
5 — B44x Plug-in Cellular Communicator (required and available separately)	

3.1 Module overview

The B450 Conettix Plug-in Communicator Interface (wired to a compatible control panel) is a four-wire powered SDI2, or SDI device that provides two-way communication over commercial cellular networks using a plug-in communicator.

The B450 Conettix Plug-in Communicator Interface bus address switch determines the bus address of the device. When required, configuration of the module is managed through the control panel, a local USB connection, or using SMS.

B450 module overview

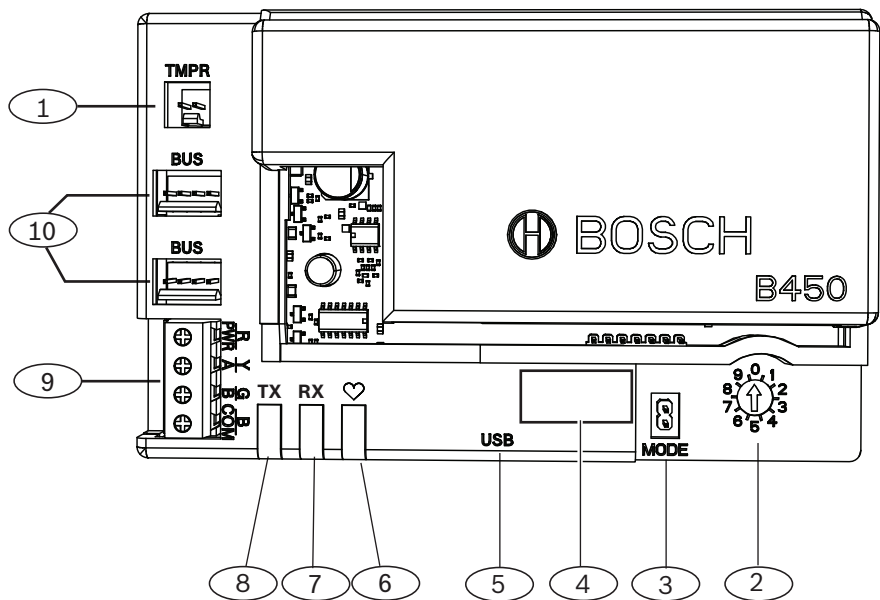


Figure 3.1: B450 Plug-in Communicator Interface

Callout – Description
1 – Tamper switch connector
2 – Bus address switch
3 – MODE 2-pin jumper connector (for future use)
4 – Bus address label
5 – USB connector (Type A)
6 – Heartbeat LED
7 – RX LED (indicates packets received from the wireless network)
8 – TX LED (indicates packets transmitted over the wireless network)
9 – Terminal strip (to control panel)
10 – Interconnect wiring connectors (to control panel or other compatible modules)

3.2 Bus address settings

The address switch determines the bus address for the B450 Conettix Plug-in Communicator Interface. The control panel uses the address for communications. Use a slotted screwdriver to set the address switch.



Notice!
The B450 reads the bus address switch setting only during power up. If you change the switch after you apply power to the module, you must cycle the power to the module in order for the new bus address setting to be used for bus communication.

Bus address label

Use the bus address label to select the desired setting on the bus address switch, depending on your control panel.

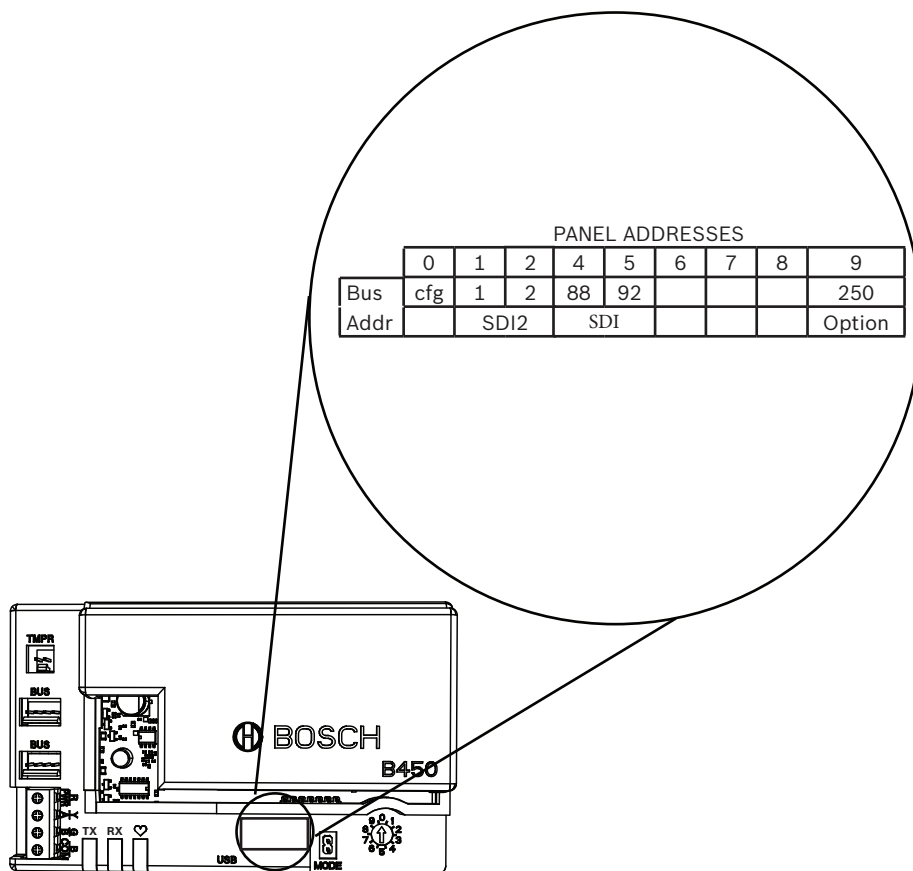


Figure 3.2: Bus address label

4 Installation

Perform the following steps to install the B450.



Notice!

Remove all power (AC and Battery) before making any connections. Failure to do so may result in personal injury and/or equipment damage.

4.1 Setting the bus address

The B450 Conettix Plug-in Communicator Interface address switch provides the value for the module's address. The figure below shows the address switch setting for address 1. Refer to the table below for panel-specific settings.



Figure 4.1: Address switch set to address 1

Control panels	Switch position	Control panel bus address	Bus type	Function
USB or SMS configuration setting	0	N/A	Any	Change configuration
B5512/B4512/ B3512,D9412GV4/ D7412GV4/D7212GV4	1	1	SDI2	Automation, RPS, or Reporting
D9412GV4/D7412GV4/ D7212GV4	2	2	SDI2	Automation, RPS, or Reporting
D9412GV4/D7412GV4/ D7212GV4, D9412GV3/ D7412GV3/D7212GV3	4	88	SDI ¹	RPS or Reporting
D9412GV4/D7412GV4/ D7212GV4, D9412GV3/ D7412GV3/D7212GV3	5	92	SDI ¹	RPS or Reporting

¹For D9412GV4/D7412GV4/D7212GV4 configurations, SDI2 bus connection is the recommended configuration option, but SDI bus configuration is also supported.

Table 4.1: B450 address switch settings

4.2 Insert the B44x communication module (required and available separately)

Insert the desired B44x communication module into the slot of the B450 until you feel the module “click” into place.

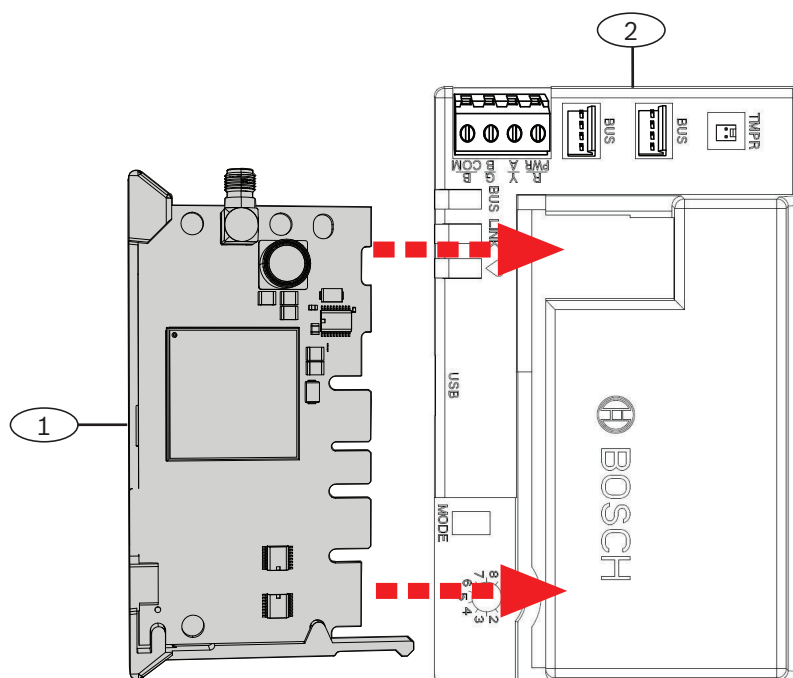


Figure 4.2: Inserting the communication module into the B450

Callout – Description
1 – B44x Plug-in Communicator module (available separately)
2 – B450 Conettix Plug-in Communicator Interface

4.3

Mount the module in the enclosure



Notice!

UL requires that for security installations, the B450 module be installed in a UL Listed enclosure with a tamper.



Notice!

If you are not using the interconnect cable, it is recommended to wire the B450 module to the compatible control panel via the terminal strip prior to mounting the B450 into the enclosure. Failure to do so will complicate the mounting procedure.

Mount the B450 Conettix Plug-in Communicator Interface using the interior wall of the enclosure's 3-hole mounting pattern and the supplied mounting screws.

You must mount the module in the control panel enclosure, or in a UL listed enclosure.

All communicators shall be housed in tampered enclosures. If the unit is used in a commercial burglar environment, and is enclosed in a commercial enclosure, that enclosure must be tampered.

If the installation is a local or police station connection, then the B450 must be mounted inside an attack resistant enclosure.

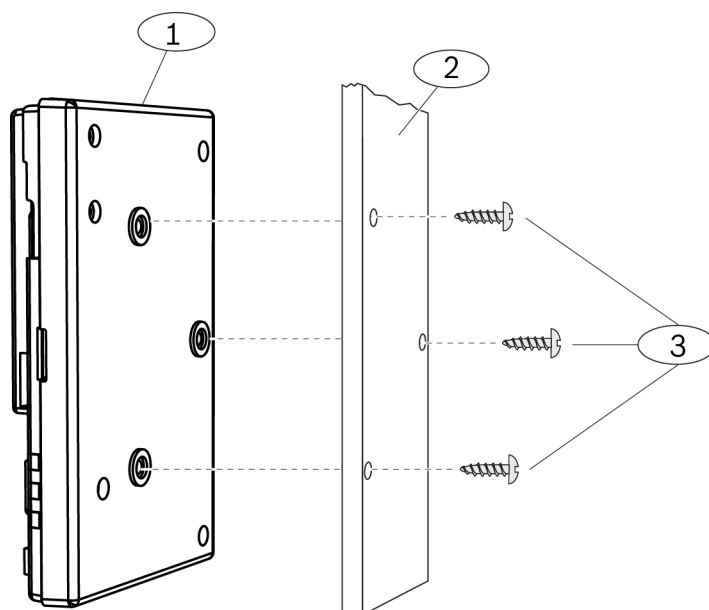


Figure 4.3: Mounting the module to the exterior wall of the enclosure

Callout – Description	
1 – B450	
2 – Enclosure (outside wall shown)	
3 – Mounting screws (3 screws included)	

Installing in a control panel enclosure

Install the B450 on the inside enclosure wall that also contains the supported control panel. The control panel powers the B450 via the terminal block or bus connection.

Installing in a separate enclosure

Install the B450 on the inside wall of a separate enclosure. The control panel in a nearby, separate enclosure powers the B450 via the terminal block or bus connection.

Installing in a separate enclosure with separate power supply

Install the B450 on the inside wall of a separate enclosure that also has a separate external power supply such as the B520 Auxiliary Power Supply Module.

4.3.1

Mount and wire the tamper switch (option for SDI2 bus only)

You can connect an enclosure door tamper switch for one module in an enclosure.

Installing the optional tamper switch for use with a B450:

1. Mount the tamper switch into the enclosure's tamper switch mounting location.
2. Plug the tamper switch wire onto the module's tamper switch connector. For the tamper switch connector location, refer to *Module overview*, page 7.
3. Verify the B450 module is configured with tamper enabled ON within the SDI2 supported control panel. Tamper is automatically enabled to ON in GV4 Series v2.00 control panels.

4.4

Install and mount the plug-in communicator antenna

Perform the following steps below to install and mount the magnetic antenna.

1. Place the magnetic antenna on top of the enclosure, or vertically on another metal surface.

**Notice!**

If you are experiencing a weak signal, place the antenna on top of a metal surface that has a radius of 10.16 cm (4 in) for optimal performance.

2. Route the antenna cable through a knock-out in the enclosure wall.
3. Connect the antenna cable to the module.
4. Secure the antenna cable to the inside of the enclosure.

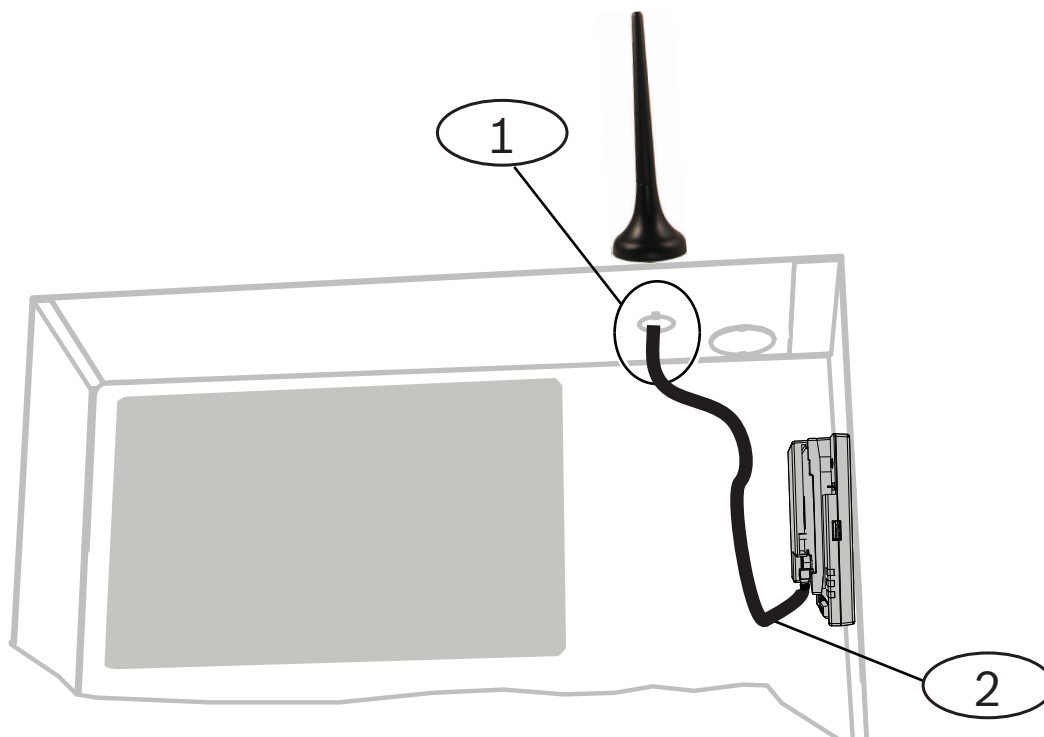


Figure 4.4: Antenna installation

Callout — Description

1 — B44x plug-in cellular communicator antenna (routed through any knock-out)

2 — B44x plug-in cellular communicator antenna cable (connected to the module)

4.5

Wire to the control panel

When you wire a B450 to an SDI, or SDI2 control panel, you can use either the module's terminal strip labeled R, Y, G, B (PWR, A, B, COM) or the module's interconnect wiring connectors (wire included). The figure below indicates the location of both the terminal strip and the interconnect wiring connectors on the module.



Notice!

Use either the terminal strip wiring **or** interconnect cable to wire to the control panel. Do not use both. When connecting multiple modules, you can combine terminal strip and interconnect wiring connectors to daisy-chain the modules in series.

4.5.1

Wire to an SDI2 control panel

Run the wiring connections from the module to the data bus terminals on the compatible control panel.

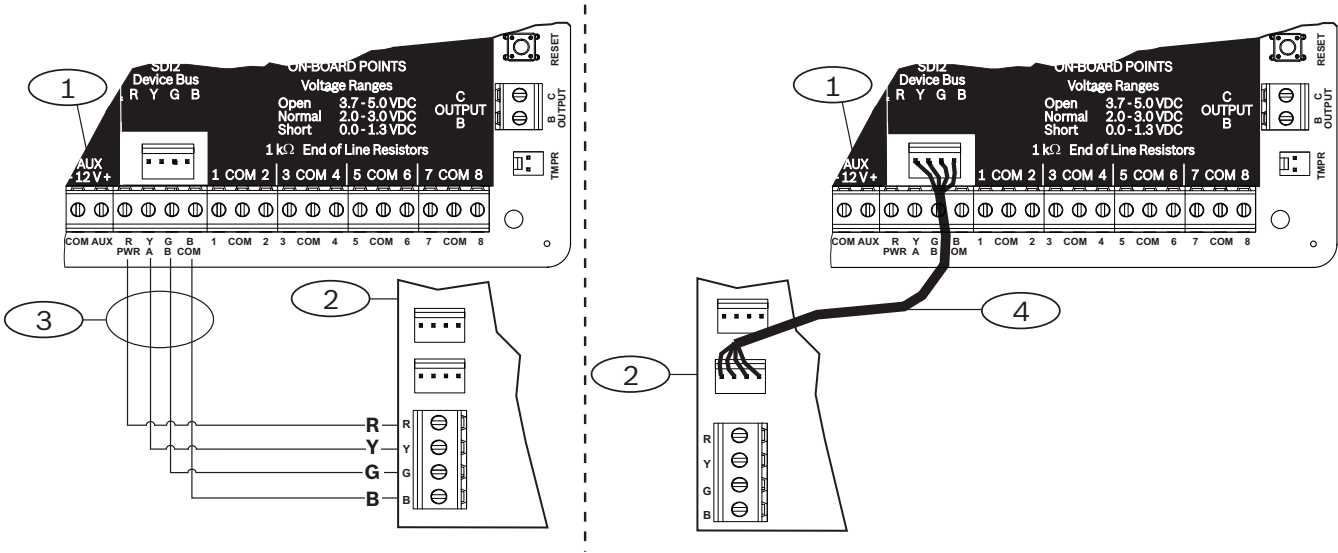


Figure 4.5: Using terminal strip or interconnect cable wiring on an SDI2 control panel (B Series control panel shown)

Callout	Description
1	Compatible SDI2 control panel (B Series control panel shown)
2	B450
3	Terminal strip wiring
4	Interconnect cable

4.5.2 Wire to an SDI control panel

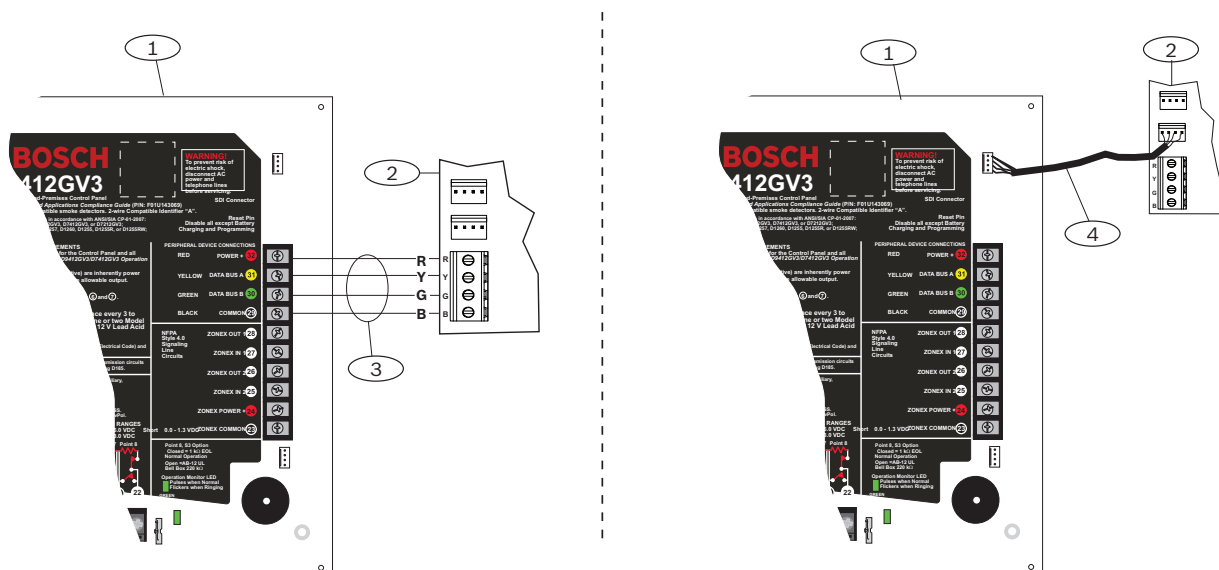


Figure 4.6: Using terminal strip or interconnect cable wiring on an SDI control panel (GV3 Series control panel shown)

Callout — Description
1 — Compatible SDI control panel (GV3 Series control panel shown)
2 — B450
3 — Terminal strip wiring
4 — Interconnect cable

4.5.3 Wire to an option bus control panel

Run the wiring connections from the module to the data bus terminals on the compatible control panel.



Notice!

When wiring the connections between the option bus terminal strip and the B450, verify the terminal position of the colored wires as they may be in a different orientation (option bus = R, B, G, and Y) and (B450 = R, Y, G, and B).

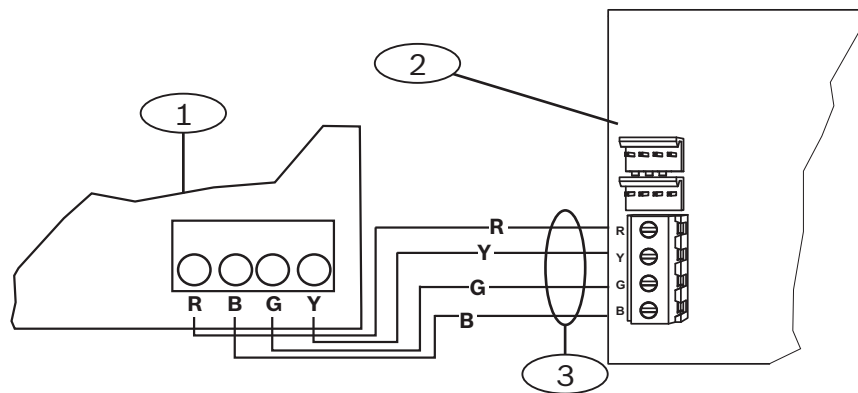


Figure 4.7: Wiring to an option bus terminal strip

Callout	Description
1	Compatible control panel (FPD-7024 control panel shown)
2	B450
3	Terminal strip wiring

For complete wiring instructions, refer to the control panel documentation.

5 Configuration



Notice!

Power up the system prior to the configuration workflows described in this chapter.

You can configure the B450 using one of the methods described in this section for your control panel type.

5.1 Plug and Play configuration

When installing under the following conditions, the B450 needs no further configuration:

- AES encryption is not required.
- Low signal delay can be no more than 200 sec.

5.2 Configuration for SDI2 control panels



Notice!

By default, when connecting a field replacement B450 to an existing SDI2 control panel, the control panel overrides some of the module settings such as; TCP/UDP Port Number, AES Encryption, Tamper, Panel Programming, IPv4 DNS Server IP Address, Alternate IPv4 DNS Server IP Address, and TCP Keep Alive Time. To keep custom module settings when you connect a module to a configured control panel, you must disable Panel Programming prior to connecting to the SDI2 bus. This is accomplished by using either USB, or SMS configuration. If the SDI2 control panel is not defaulted, the panel sends the network configuration parameters to the B450.

Address-only configuration conditions

An SDI2 control panel automatically configures a newly connected module.

1. If the control panel is not at factory default, it transfers the configuration settings in the control panel to the B450.
2. Set the address switch to the correct address for the control panel (SDI2 control panels use address 1 or 2).
3. Program the control panel communication settings using RPS or the keypad.

The control panel stores the module settings and automatically programs a defaulted module when connected. If manual module programming is required, use USB or SMS configuration to set the Panel Programming parameter to **Disabled** before installing.

5.2.1 Configuring and viewing status from RPS

For SDI2 control panels, the networking related parameters in the *Networking parameters in RPS* table can be configured through the panel or RPS. When cellular specific parameters need to be modified, refer to the USB or SMS configuration sections within this installation and operation guide for programming workflows and operation.

The B450 parameters within RPS can be found under the *SDI2 Modules* section under **B42x Ethernet Communicator**. The B426 and the B450 modules share these parameters. Refer to the illustration below for RPS menu selections.

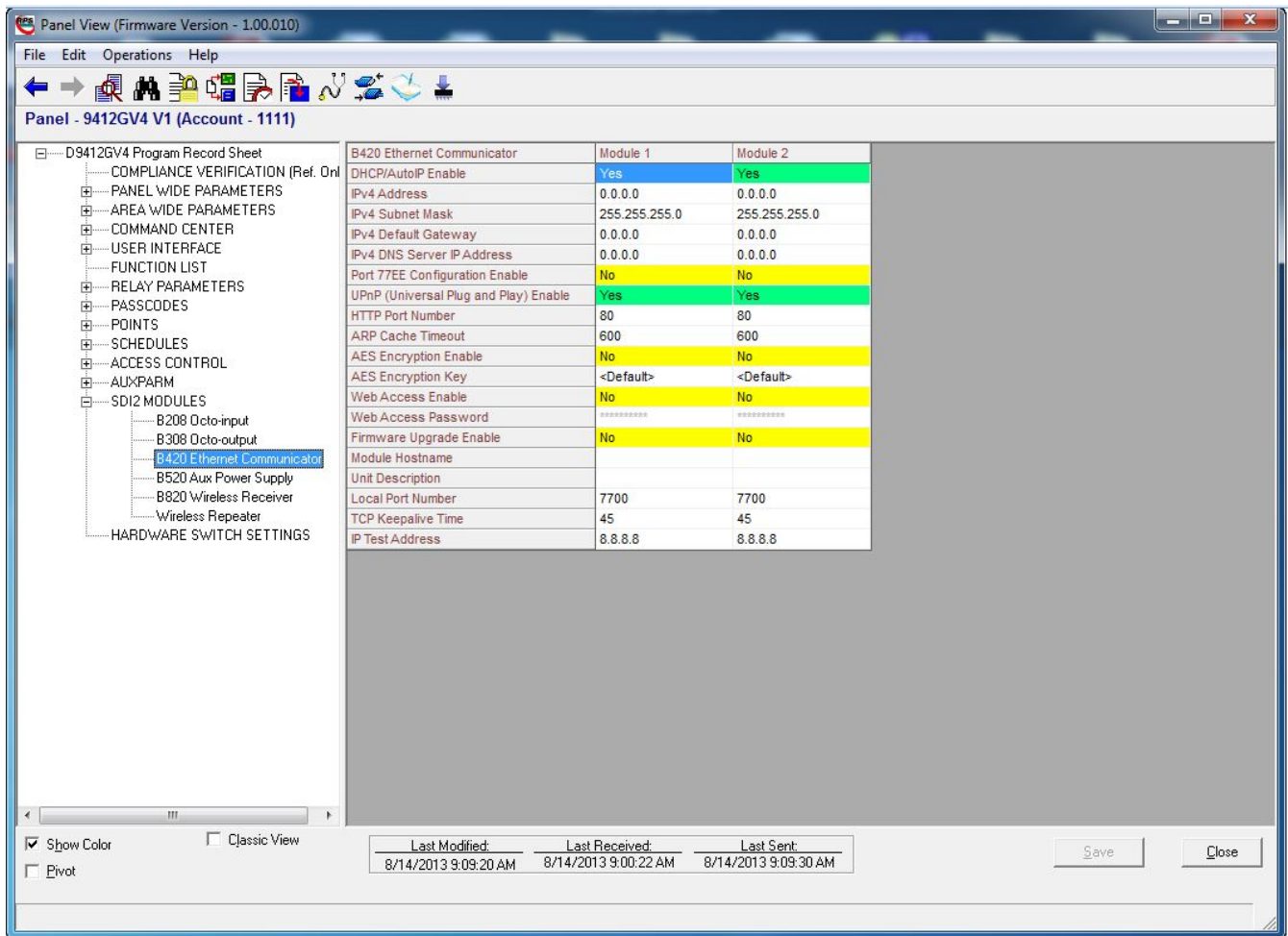


Figure 5.1: B450 settings shown as B42x in RPS with a GV4 control panel at v1.00

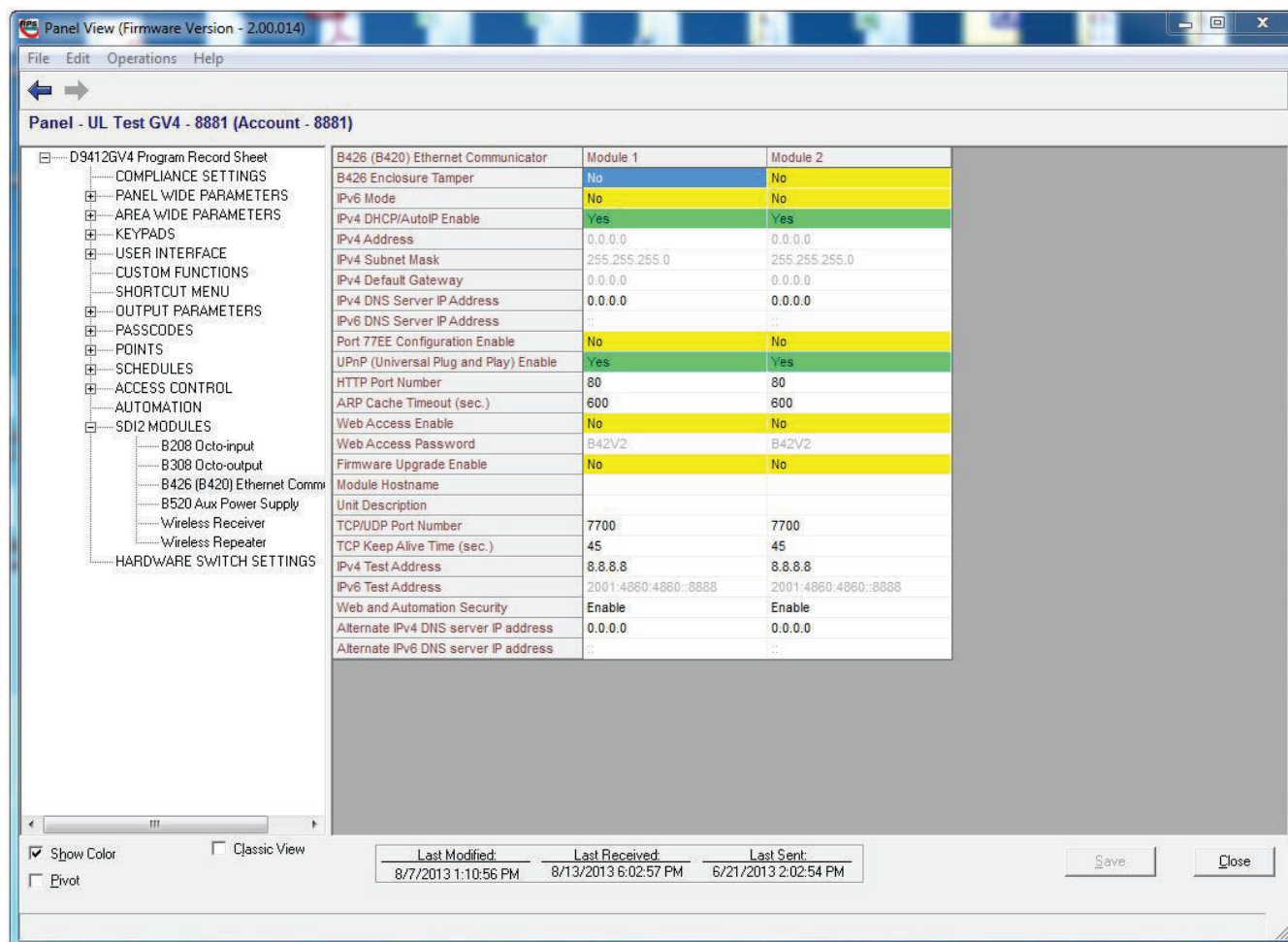


Figure 5.2: B450 settings shown as B42x in RPS with a GV4 control panel at v2.00

Reference the table below for parameters configured by RPS.

Parameter	Value	Description
Tamper (for GV4 ([v1.0.x or higher] control panels)	0 = Disabled 1 = Enabled	When enabled, allows tamper and tamper restore conditions to be reported to an SDI2 control panel. Notice! Only control panels with a SDI2 bus connection to the B450 can report a tamper condition.
IPv4 DNS Server IP Address	IPv4 address format (0.0.0.0)	The B450 uses the DNS server addresses supplied by the cellular network when the Primary DNS Server address option is configured as 0.0.0.0. If the address is not configured as 0.0.0.0, the B450 installs the Primary DNS Server address.
Web access password	Enter a 4 – 10 character password to access module programming Do not use the characters ; or !	The web access password is used to allow access to module programming. For a B450 module, the password controls configuration from the USB menu and SMS text.
TCP/UDP Port Number	1 to 65535 (7700)	Sets the source port for the B450.
Alternate IPv4 DNS Server IP Address	IPv4 address format (0.0.0.0)	If the address is not configured at 0.0.0.0, the B450 installs the Alternate DNS Server address.
TCP Keep Alive Time	0 – 255 sec (45)	This parameter determines how long to wait between transmissions to keep an idle TCP connection to a remote host from terminating due to inactivity.
IPv4 Test Address	IPv4 address format (0.0.0.0)	The IPv4 Test Address is used by the module to ping an internet address as part of the IP diagnostics.
IPv6 Test Address	IPv6 address format (0.0.0.0)	The IPv6 Test Address is used by the module to ping an internet address as part of the IP diagnostics.

Table 5.1: B450 networking parameters configurable in RPS

**Notice!**

If you are using a GV4 version 1.00 control panel, select “B420 Ethernet Communicator” within RPS. If you are using a GV4 v2.00 control panel or higher, or a B Series control panel, select “B426 Ethernet Communicator” within RPS.

Information about the B450 such as its Status, IP Address, Bus Voltage and the assigned phone number of the plug-in module can be found on the RPS Diagnostics screen for the B42X module per figure 5.2. The plug-in communicator's phone number is displayed in the "Hostname" field. Refer to the illustration below.

B420 Ethernet Communicator

Module Setting	Module 1	Module 2
Product ID	88096.16041400007	---
Firmware Version	3.1.2	---
Updater Version	0.0.0	---
Hardware Version	1.0.0	---
IPv4 IP Address	10.33.0.42	---
MAC-48 Address	00-00-00-00-00-00	---
Hostname	315-576-8000	---

Module Status	Module 1	Module 2
Missing	No	---
Trouble	No	---
Open Wire	No	---
Low Bus Voltage	No	---
Network Connection Failure	No	---
IP Address Failure	No	---
LAN Failure	No	---
WAN Failure	No	---
DNS Failure	No	---

☒ Refresh continuously

Warning: Please make sure the Control Panel configuration data is in sync with the RPS configuration data to display the correct status for SDI2 modules

Get Current Done

Figure 5.3: B450 status shown as Ethernet Communicator in RPS Diagnostics with GV4 version 1.00

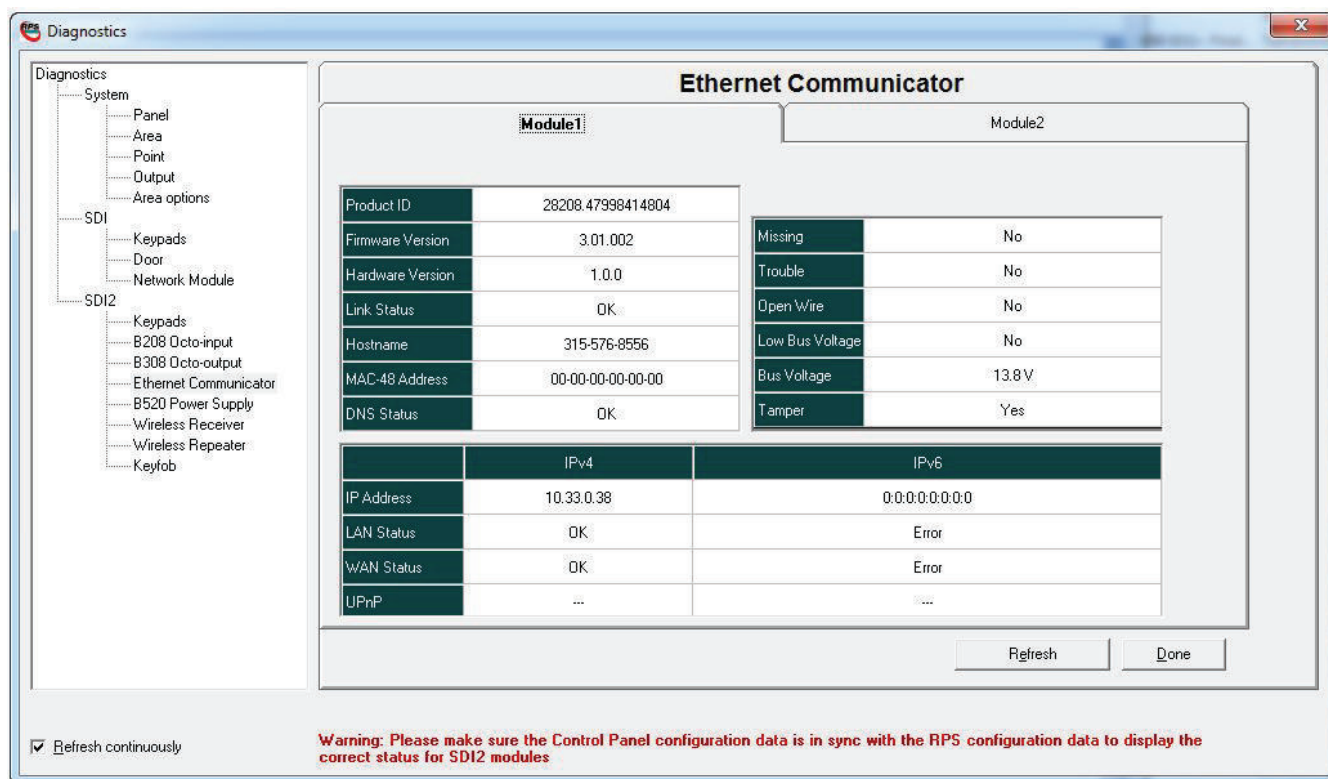


Figure 5.4: B450 status as shown as Ethernet Communicator in RPS Diagnostics with GV4 version 2.00

5.3 Use USB to configure the B450

You can use a USB connection from a laptop PC to the B450 to configure the B450 on-site. The supported USB cable used to establish connection is a Type A to A, male-to-male cable.



Notice!

USB connection via the USB cable is used for temporary configuration programming only.

Before you can access the USB user interface, you must install the **RBUS1CP.inf** file, and USB driver on the target PC or laptop. The **RBUS1CP.inf** file and USB driver are available on the supplied CD-ROM. You need to install this file only once on the target PC or laptop.

If the B450 CD-ROM is not available:

1. From your Internet browser, go to: <http://www.boschsecurity.com> to open the Bosch Web site.
2. Select the web site for your region and country.
3. In the **Online Catalogs** section on the left, click the **Intrusion Alarm Systems** link.
4. Under the **Intrusion Alarm Systems Products** heading, scroll to the **Conettix - Information Transport Solutions** section. Click the **Show product section** link.
5. Click the **Conettix IP** link.
6. Scroll to the **B450 Plug-in Communicator Interface** section. Click the section title to open the product page.
7. Under the product image, click the **Software** tab.
8. Click **OK** to accept the license agreement.

9. To the right of the B450, click on the language link (for example, en).
The **File Download** dialog box opens.
10. Click **Save** to save the file to the target PC or laptop. Perform this task to download both the USB driver file, and the **RBUS1CP.inf** file.
11. Supply power to the B450.
12. Connect the B450 to the target PC or laptop, using a USB Type A to A cable. A New Hardware Found window appears on the computer.
13. Install the **RBUS1CP.inf** file onto your PC or laptop. Verify through the device manager that the appropriate .inf installs properly, and is listed under the **Ports (COMM & LPT)** section. The correct .inf file is **B450 Config Interface**.

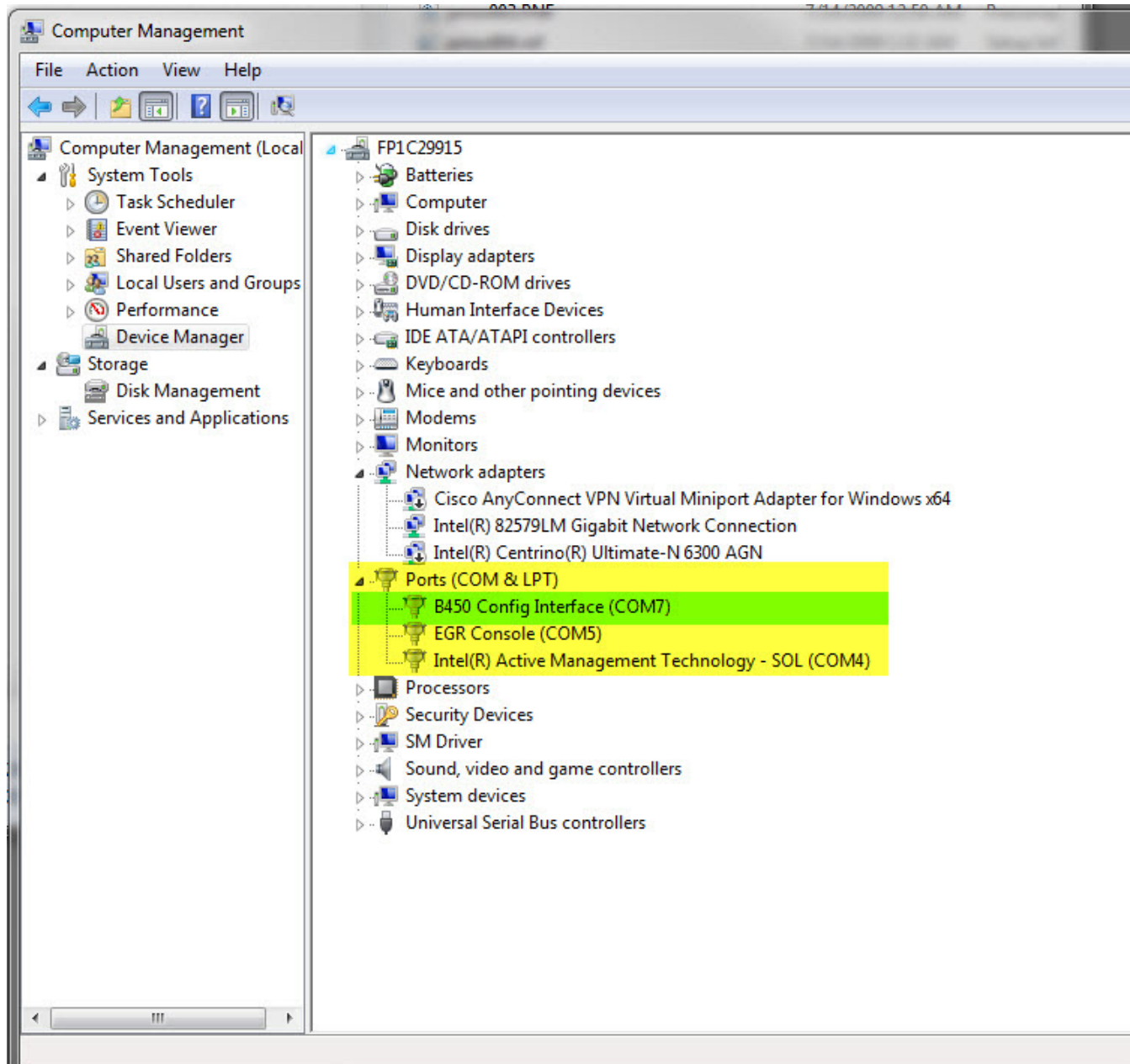


Figure 5.5: RBUS1CP.inf installed inside Device Manager

14. Install a communication program to configure the B450.

5.3.1 Install a communication program

To use USB connection from a computer to the B450 to configure the B450, you must use a communication program.

- Windows XP. The Microsoft Windows XP installation automatically installs HyperTerminal, a Microsoft communication program, when Windows installs. If HyperTerminal is not installed, install it from the Windows XP installation disc, or install Tera Term from the B450 CD.
- Windows Vista and Windows 7/8 installations no longer include a communication program when the operating system installs. Install Tera Term from the B450 CD.

Install the communication program that supports your configuration (Hyper Terminal or Tera Term), depending on your laptop or PC's operating system.



Notice!

Tera Term is preferred in all applications as its operation is understood by Bosch Technical Support if assistance is required.

Installing Tera Term

When you perform the Tera Term installation, follow the prompts in the installation wizard, but on the Select Components page of the wizard, select **Compact installation** from the drop-down list. Refer to the figure below.

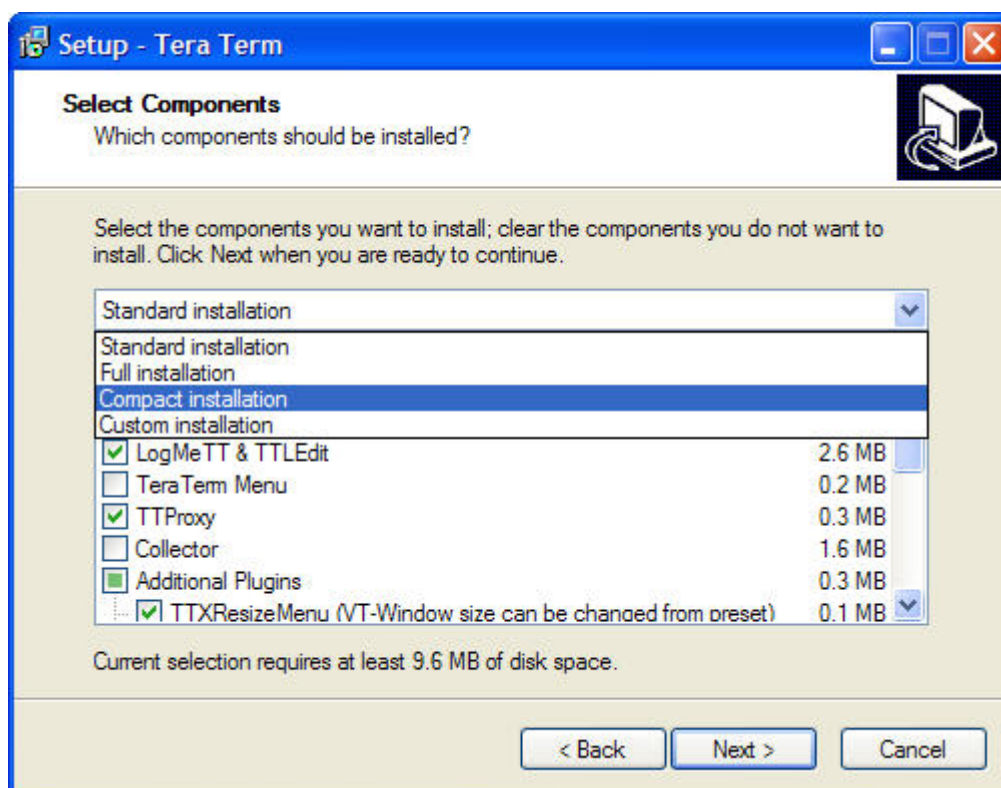


Figure 5.6: Setup - Tera Term wizard's Select Components window

Tera Term version interface

After installing the latest Tera Term version, double-click on Tera Term to launch the program. The Tera Term window opens.

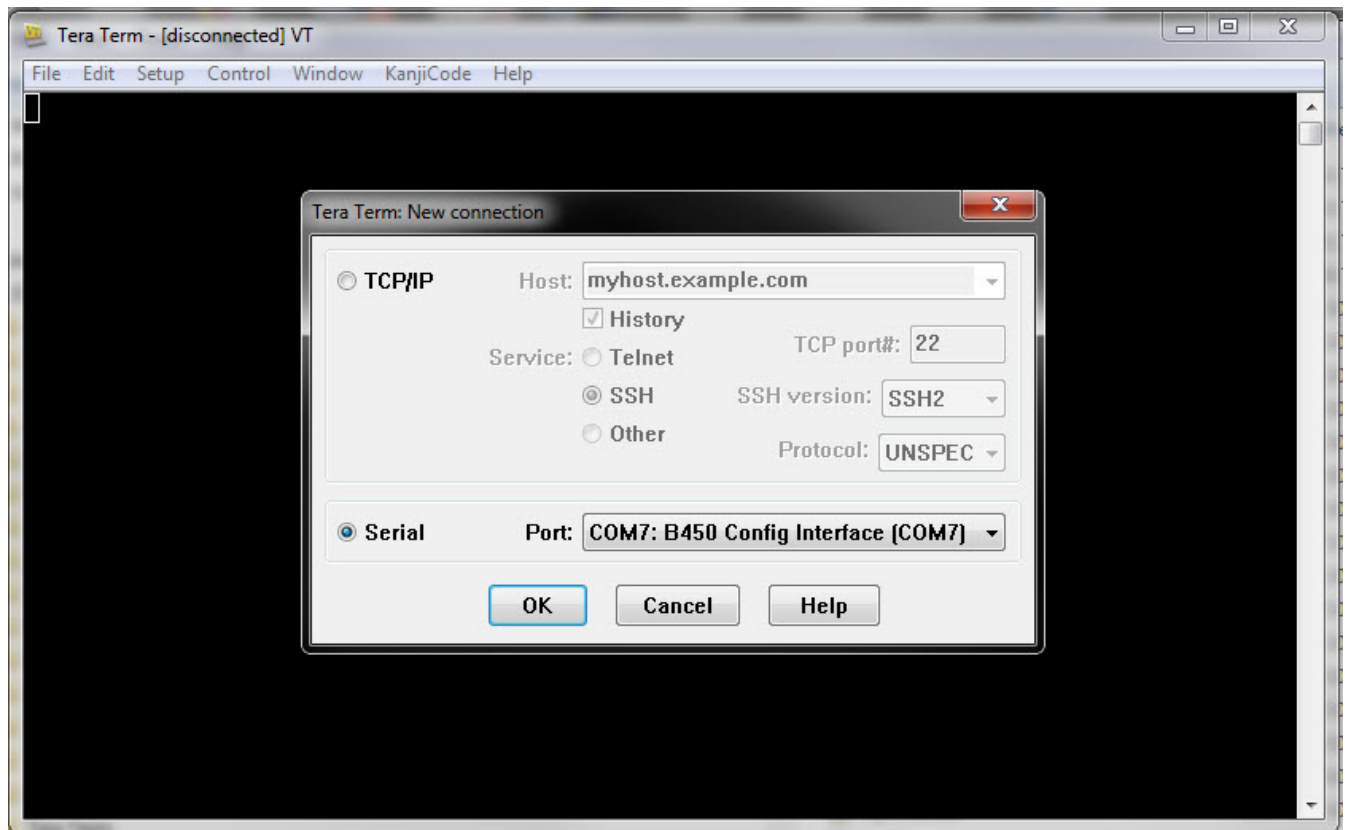


Figure 5.7: Tera Term Pro version 4.77 window shown

5.3.2 Log into the USB interface



Notice!

To allow for USB configuration, address switch must be set to 0. Powering down the module after changing the bus address switch for programming is not required.

1. Ensure that the USB-Type A male-to-male cable is connected to the B450 and the target PC or laptop.
2. From Windows, start a terminal session by launching Hyper Terminal on Windows XP or earlier, or launching Tera Term on Windows Vista/Windows 7/Windows 8.
3. Set up a connection on the new virtual serial COM port (for example, Port: COM7: B450 [COM7]). If the B450 is not connected to the computer, or the USB driver is not installed, the B450 does not appear in the list.
4. After the connection is established, press [Enter].
The B450 USB login window opens.

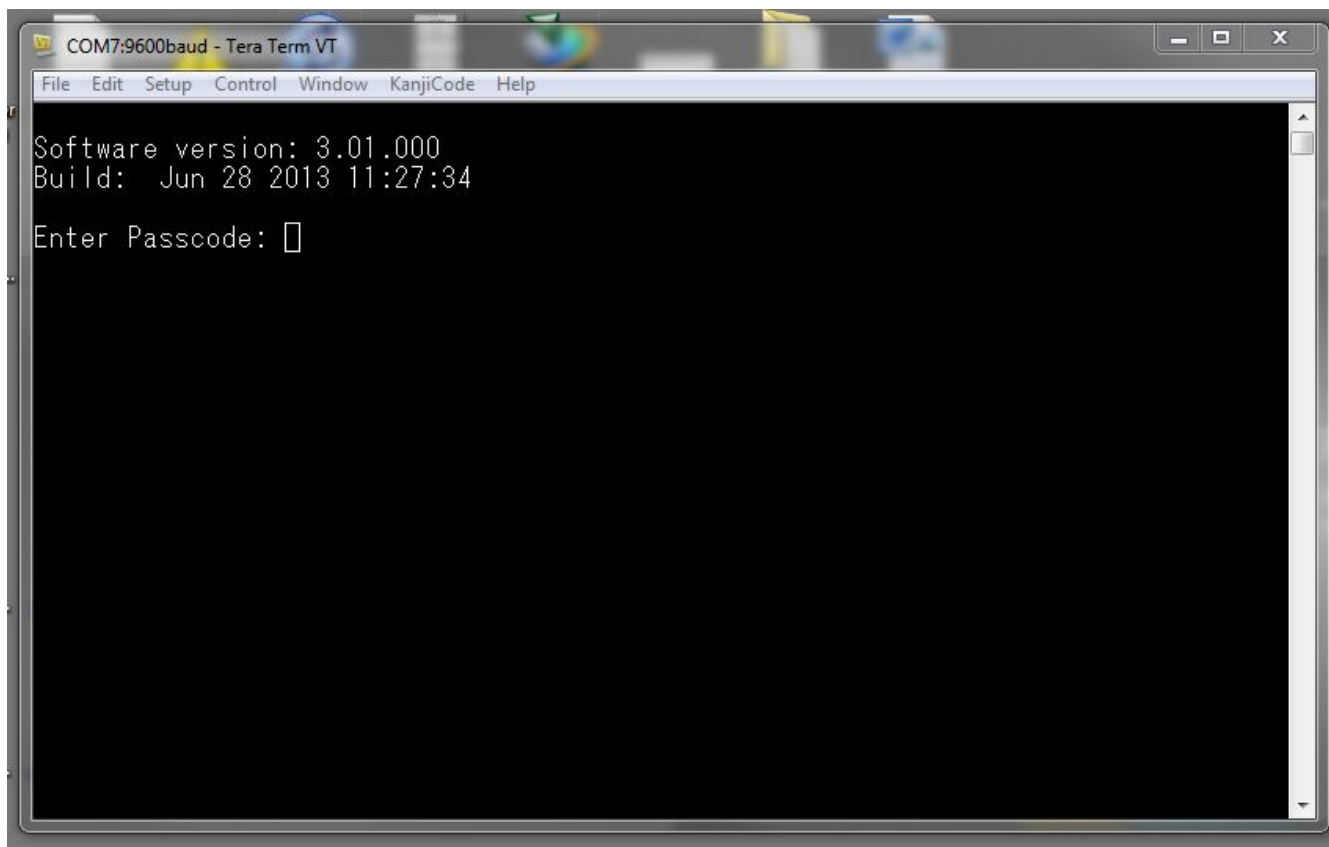


Figure 5.8: B450 USB login window

5. Enter the password to log on. The default password is **B450**.
The user interface allows three attempts to enter the password correctly. After three failed attempts, the B450 shows a Too many attempts error message, and the USB interface enters into an idle state for 30 sec. Repeat Steps 3 through 6. at the conclusion of 30 sec.
6. Press [Enter] to continue. The USB main menu opens.

5.3.3 USB Main menu

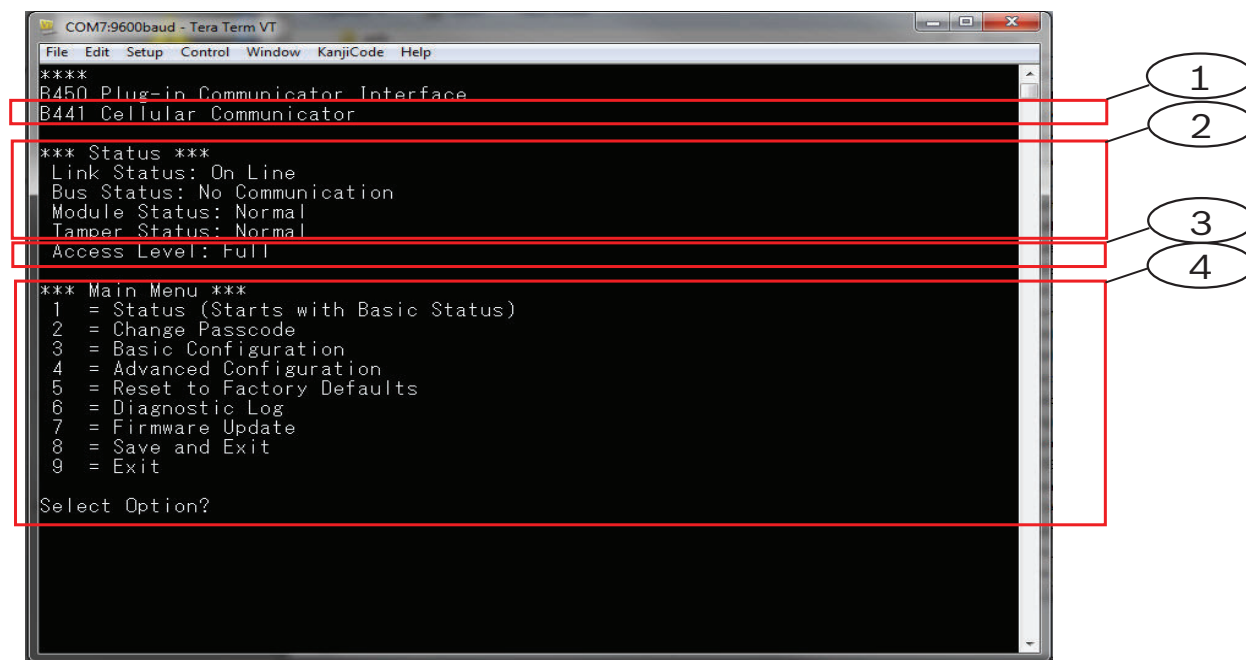


Figure 5.9: USB Main Menu

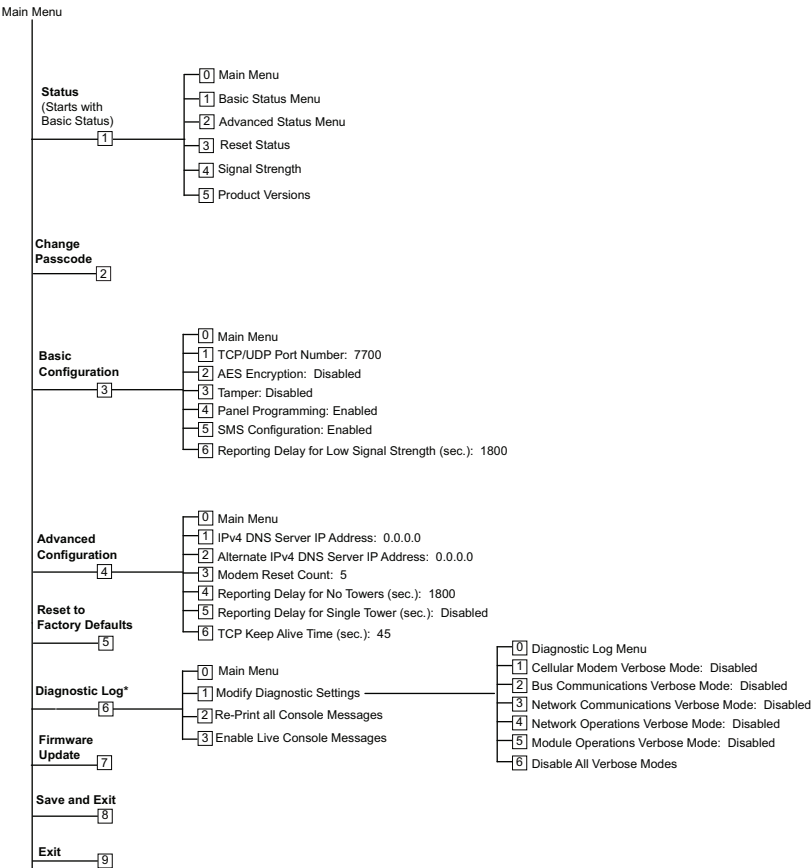
Callout	Description
1	Installed device
2	Current device status
3	Current access level
4	Main menu options

The USB main menu appears:

- after a user enters a password successfully
- every time the user presses [Enter] without first selecting an option from the main screen
- upon returning from a sub-menu.

5.3.4 USB menu structure

The following illustration depicts the B450 menu structure.



* The Diagnostic Log option is used in troubleshooting communication issues with the B450. Use of the Diagnostic Log option is to be used only at the direction of TECHNICAL SUPPORT.

Figure 5.10: USB menu structure



Notice!

Changes or edits to programming are discarded if you select the Exit option, and exit the menu. If you make changes or edits, select the Save and Exit option to ensure programming changes are saved.

5.3.5

USB menu

For a description of the USB option menu items, refer to the tables in the following sections. To go to a specific menu option, enter the appropriate menu option.



Notice!

Any and all changes are lost and will have to be re-programmed if there is inactivity (last key press) within the Tera Term USB session within a 5-minute duration of time.

Using the Escape (Esc) key

Press the Escape (Esc) key without making any programming changes will return you to the previous menu.

Pressing the Escape key after entering data will clear data entered.

Option	Press to Select	Description
1. Status (Starts with Basic Status)	1	To access and view the link, modem, and bus status For additional menu descriptions, refer to the <i>USB Status sub-menu parameters</i> table below for more information.
2. Change Passcode	2	To change the login passcode, enter the new passcode twice. The second entry confirms the new passcode. Passcodes must be 4-10 characters long, and are case-sensitive. 0-9, A-Z, a-z, and special characters are allowed. Notice! If SMS configuration is used, do not use semicolon (;) or exclamation mark (!) as part of the passcode.
3. Basic Configuration	3	Select to program Basic Configuration options. Press 0 to return to the Main menu. To change a basic parameter, select the option to change, and then enter in the new value.
4. Advanced Configuration	4	Select to program Advanced Configuration options. Press 0 to return to the Main menu. To change an advanced parameter, select the option to change, and then enter in the new value.
5. Reset to Factory Defaults	5	Select to reset all factory default values. All fields are cleared and the factory default values are restored. Notice! A non-defaulted SDI2 control panel will overwrite the default settings if connected to the defaulted module.
6. Diagnostic Log	6	Select to review the Diagnostic log.
7. Firmware Update	7	Select this option to update the firmware in the B450. Notice! Download your update file from the Bosch website prior to performing an update. For more information on Firmware update workflows, refer to <i>Firmware Update page, page 35</i> .
8. Save and Exit	8	Press 8 to save changes and exit the menu. A message of Changes saved displays in the window. This occurs if changes have been made, otherwise a message of No changes made displays in the window.
9. Exit	9	Select to exit the menu and log out. You must enter the passcode to log back in. Notice! If configuration changes have been made, and the Exit option is selected, those changes are discarded.

Table 5.2: USB Main Menu parameters**Status sub-menu parameters**

For a description of the Status sub-menu parameters (Reset Status, Signal Strength, and Product Versions), refer to the table below.

To go to a specific menu option, enter the appropriate menu item number to enter that item.

Option	Press to Select	Description
3. Reset Status	3	The status displays show several items that are counts of activities, such as UDP packets transmitted. When reset status is selected, all counts are returned to zero. This is not required for normal operation.
4. Signal Strength	4	The current signal strength records every 15 minutes for up to 48 hours worth of data. When signal strength is selected, up to 192 values are displayed representing the signal strength values over the last 48 hours. If the B450 has been powered up less than 48 hours, the list shows only the samples taken so far.
4. Product Versions	5	This option displays the software version of all entities in the B450. The following list is an example of the versions displayed: *** Product Versions *** B450 Application: V 3.01.002 B450 Boot Loader: V 1.05.001 RTOS: V 3.03.500 Fusion Stack: V 8.07.3703 Cellular Manager: V 1.117.442 UPKI Encryption: V 3.03.002 AES Lib: V 01.00.000 Modem Firmware: V 15.00.021

Table 5.3: Status sub-menu parameters

Diagnostic Log sub-menu parameters

For a description of the Diagnostic Log sub-menu parameters (Modify Diagnostic Settings, Re-print All Console Messages, and Enable Console Messages), refer to the table below.

**Notice!**

The Diagnostic Log option is used in troubleshooting communication issues with the B450 . Use of the Diagnostic Log option is to be used only at the direction of TECHNICAL SUPPORT. Refer to *Diagnostic log*, page 41 for more information.

To go to a specific menu option, enter the appropriate menu item number to enter that item.

Option	Press to Select	Description
1. Modify Diagnostic Settings	1	The Diagnostic logging is intended for use only under Bosch direction. Diagnostic settings determine which types of messages to display.
2. Re-print All Console Message	2	The Re-print all option prints any diagnostic messages that have already occurred and are stored in the B450's buffer. This can print what just happened if an issue occurs.
3. Enable Live Console Messages	3	Enable live console messages provides real time output of diagnostic messages. This allows the PC running TeraTerm to log what is occurring in the module and can log for longer periods of time.

Table 5.4: Diagnostic Log sub-menu parameters

SMS and USB configuration parameters

**Notice!**

The table below shows all parameters available through SMS or USB configuration. Values in **bold** are default settings.

ID	Parameter	Values	Description
1	Current Password	4 to 10 characters (B450)	Mandatory and case sensitive. Notice! Make sure you record and record your password.
2	New Password	4 to 10 characters	New password, as desired. Case sensitive.
13	TCP/UDP Port Number	1 to 65535 (7700)	Sets the source port for the B450.
15	AES Encryption	0 = Disabled 1 = 128 bit, 2 = 192 bit, 3 = 256 bit	Security encryption on or off. The setting must match the encryption settings in the receiver. Notice! This setting applies to SDI, and GV4 v1.0.x control panels only.
16	AES Encryption Key	32, 48, or 64 digits max. 0-9, A-F, a-f allowed 01020304050607080910111213 14151617181920212223242526 272829303132	The AES Encryption Key must match the encryption key in the receiver. Notice! This setting applies to SDI, and GV4 v1.0.x control panels only.
19	Tamper (for GV4 v1.0.x control panels)	0 = Disabled 1 = Enabled	When enabled, allows tamper and tamper restore conditions to be reported to an SDI2 control panel. Notice! Only control panels with a SDI2 bus connection to the B450 can report a tamper condition.

ID	Parameter	Values	Description
20	SMS Configuration	0 = Disabled 1 = Enabled	Allows the B450 to be configured via SMS configuration.
65	IPv4 DNS Server IP Address	IPv4 address format (0.0.0.0)	The B450 uses the DNS server addresses supplied by the cellular network when the Primary DNS Server address option is configured as 0.0.0.0. If the address is not configured as 0.0.0.0, the B450 installs the Primary DNS Server address.
66	Alternate IPv4 DNS Server IP Address	IPv4 address format (0.0.0.0)	If the address is not configured at 0.0.0.0, the B450 installs the Alternate DNS Server address.
67	Panel Programming Enabled	0 = Disabled 1 = Enabled	Select to enable or disable control panel programming. This enables/disabled configuration of the B450 by the control panel.
68	Reporting Delay for Low Signal Strength	0 – 3600 sec. (1800)	Sets the duration of time when the B450's signal strength is measured. The value selected determines how long the signal strength must be at a low condition before reporting as low, or how long the signal strength must be normal before reporting as normal.
69	Reporting Delay for No Towers	0 – 3600 sec. (1800)	Amount of delay before the module reports a trouble for not being able to receive signals from a cell tower.
70	Reporting Delay for Single Tower	0 – 3600 sec. (0)	Amount of time delay before module reports a trouble due to getting signals from only one tower instead of multiple towers.
71	Modem Reset Count	0 – 99 communication attempts (5)	This parameter determines how many times a packet of data must be sent without a reply before the cell module modem is reset to attempt restoring communications.
72	TCP Keep Alive Time	0 – 255 sec (45)	This parameter determines how long to wait between transmissions to keep an idle TCP connection to a remote host from terminating due to inactivity.

Table 5.5: SMS and USB configuration parameters

5.4 Short Message Service (SMS) configuration

The B450 supports configuration by SMS connection. The Short Message Service feature allows an installer to configure the B450 through the use of a mobile phone, or any other service that sends compatible SMS text messages.

5.4.1 Use SMS to configure the B450

The SMS string follows a specific format. If the configuration message exceeds 160 characters, you must send multiple messages. Refer to Compose the Configuration SMS for more details.

When the B450 receives the final valid part of an SMS message, it accepts the configuration.

**Notice!**

To allow the receipt of SMS data, the bus address switch must be set at position 0. Refer to the tables in this section for LED activity.

If the bus address switch is not set to 0, incoming SMS data is discarded.

Enter CONFIG MODE

Ensure that the bus address switch is set to 0.

Compose the Configuration SMS

Use the appropriate SMS template for the selected mode of operation, and compose the configuration SMS message on your mobile phone. SMS can contain only 160 characters. Refer to Multiple SMS Messages (for Messages Longer than 160 Characters) for instructions for sending a multiple SMS configuration.

The templates below contain only the essential configuration IDs. For additional configuration IDs, refer to the SMS configuration parameters.

**Notice!**

Separate each ID or value pair with a semi-colon ; (for example, %1;1=B450;19=1;!). To allow spanning of configuration across multiple messages, each SMS starts with the sequence number followed by the command line separator.

Use the ! character to signal the end of the configuration data. Refer to your cellular phone's documentation for available characters. You must include the current SMS configuration passcode in the SMS text message to allow the module to save the new configuration data.

SMS configuration parameters

ID	Description
1=	Current passcode (4 to 10 characters); default = B450
2=	New passcode (4 to 10 characters)
Basic parameters	
13=	TCP/UDP port number: 7700 (1 to 65535)
15=	AES encryption – 0 = disable – 1 = 128 bit – 2 = 192 bit – 3 = 256 bit
16=	AES encryption key (0 to 9, A-F, a-f, based on key size, none, 32, 48, or 64 digits)
19=	Tamper (V1.0.x control panels on SDI2 bus) – 0 = disable – 1 = enabled
20=	SMS configuration – 0 = disabled – 1 = enabled

ID	Description
Advanced parameters	
65=	Primary DNS server address (IPv4 address format)
66=	Alternate DNS server address (IPv4 address format)
67=	Panel programming enabled – 0 = disabled – 1 = enabled
68=	Reporting delay for low signal strength (0 - 3600 sec)
69=	Reporting delay for no towers (0 - 3600 sec)
70=	Reporting delay for single tower (0 - 3600 sec)
71=	Modem reset count (0 – 99)
72=	TCP keep alive time (0 – 255 sec)

Table 5.6: SMS configuration parameters**Multiple SMS Messages (for Messages Longer than 160 Characters)**

ID	Description	Sample SMS ¹
%1;	SMS sequence number 1	%1;1=B450;2=secret123;15=3; 16=010203040506070809101112131 41516;
1=B450;	Current password	
2=secret123;	New password (case sensitive)	
15=3;	Enable AES encryption	
16=01020304050607080910 111213141516;	Sample AES key	
¹ As you enter in the various ID's into your cell phone, do not press the return key. Doing so will cause the B450 to ignore the programming request.		

Table 5.7: Double SMS example, part 1

ID	Description	Sample SMS ²
%2;	SMS sequence number	%2;19=1;!
19=1;	Tamper enabled	
!	End of configuration	
² When you end the configuration programming with the exclamation mark, do not enter any values. Doing so may cause the B450 to ignore the programming request.		

Table 5.8: Double SMS example, part 2

Send the Configuration SMS

1. Send the configuration SMS to the B44x module's phone number. The transmission might take several minutes. Because the bus address switch is set to 0, the B450 waits for an SMS until a message is received.
2. Observe the LEDs on the B450. When the Transmit (TX) and Receive (RX) LEDs will flash in unison at a 1 second interval indicating a successful SMS was received. If the SMS was received but was not valid the Transmit (TX) and Receive (RX) LEDs will alternate flashing at 1/2 second interval. Both flashing patterns will continue until the bus address switch is moved from position "0."

**Notice!**

If the LEDs indicate an invalid SMS, repeat the steps in Enter CONFIG MODE. Refer to the tables in *Maintenance and troubleshooting*, page 39 section for more information on LED descriptions. Ensure that your configuration SMS contains the correct information, as well as sending the SMS to the correct phone number for the module, or use the USB connection to configure the B450

Exit from CONFIG MODE

1. Change the bus address switch to the desired value, depending on the supported control panel. Changes to the B450 configuration are accepted.
2. Check the signal strength and Heartbeat LED for status.

5.5

Firmware Update page

Firmware updates are performed through the USB interface via a communication program such as Hyper Terminal or Tera Term.

**Notice!**

When performing a firmware update, verify that the update software file to be downloaded is the most current software update version. No changes to the firmware occur if the firmware update version is the same version as the current version installed on the B450.

1. Ensure that the USB cable is connected to the B450 and the target PC or laptop.
2. From Windows, start a terminal session by launching Hyper Terminal on Windows XP or earlier, or launching Tera Term on Windows Vista/Windows 7/Windows 8.
3. Log into the USB interface as described in *Log into the USB interface*, page 25, starting at step 3, and continuing through to step 6. The B450 USB login window appears, listing the current software version and build.

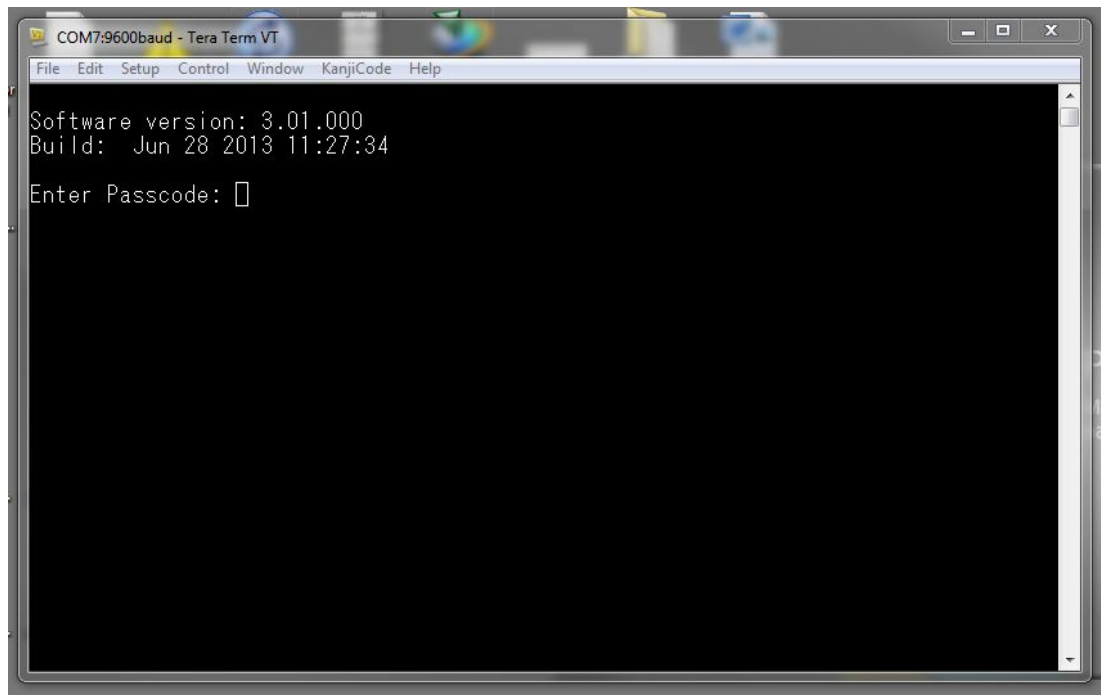


Figure 5.11: B450 USB login window

4. Select option 7 Firmware Update and press [Enter].
5. From the Tera Term main menu, select File>Transfer>XMODEM>Send.

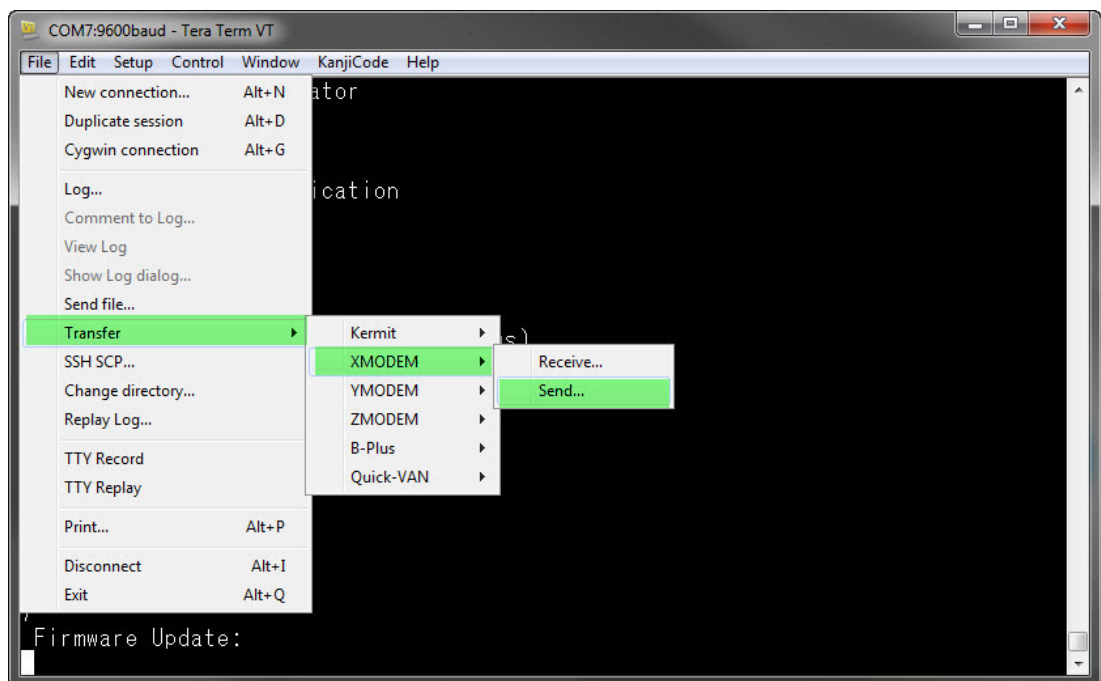


Figure 5.12: Firmware update send window

6. In the XMODEM Send dialog window, navigate to the folder location and select the firmware update software you downloaded. The file ends in *.kfw extension.

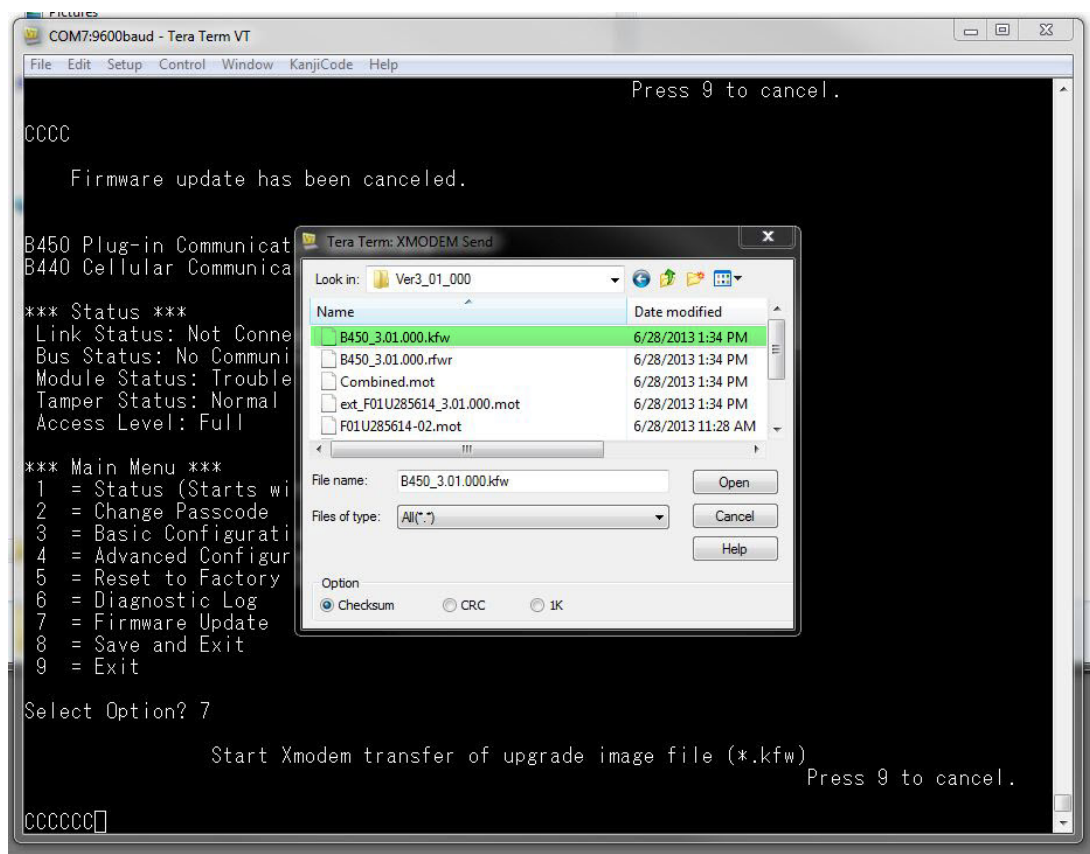


Figure 5.13: File navigation

7. Click Open to start the firmware update. The Tera Term: XMODEM Send dialog box opens and indicates the update process.

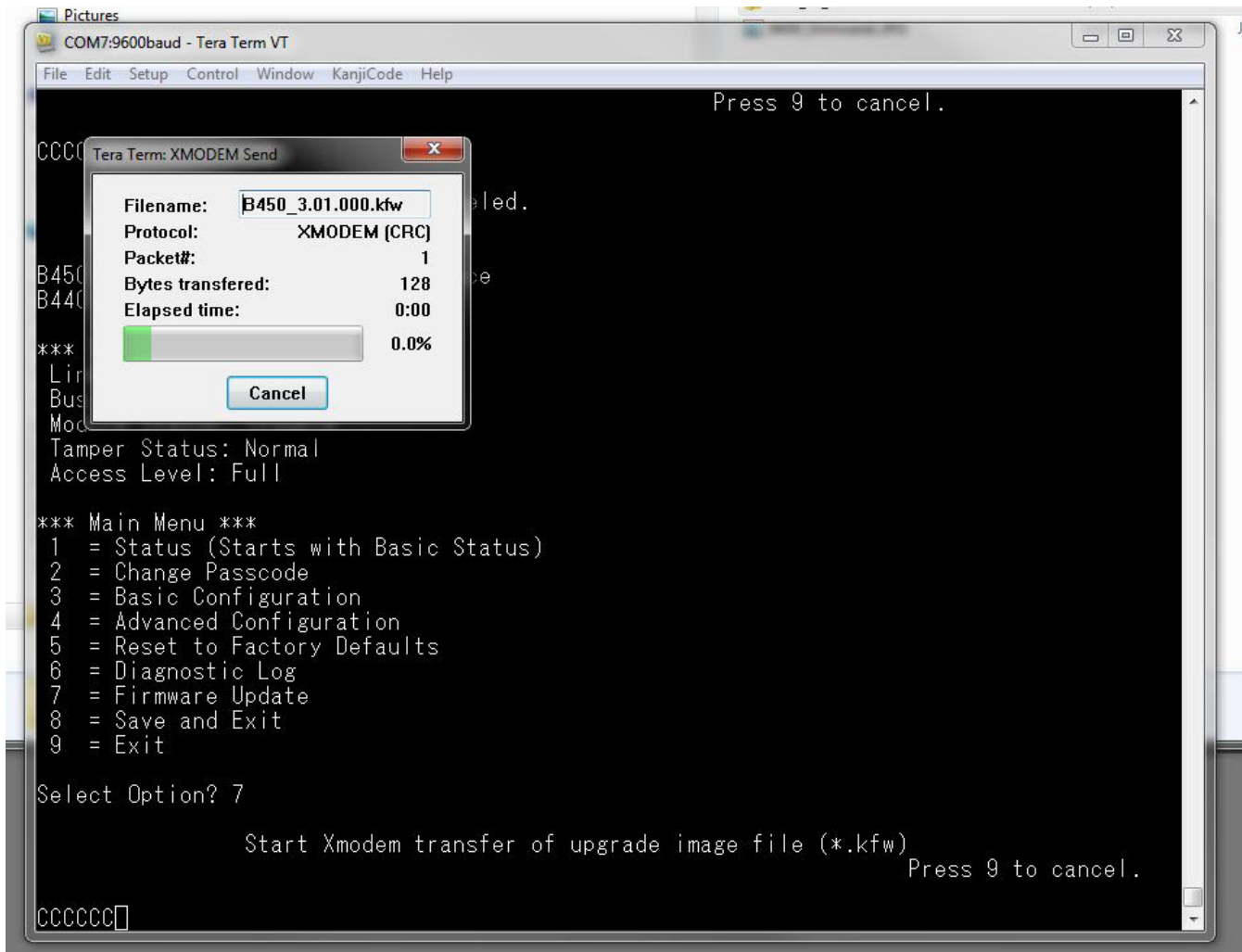


Figure 5.14: Tera Term XMODEM Send dialog box

8. When the file transfer completes, the Tera Term: XMODEM Send dialog box closes automatically. Within the Tera Term window an updating to firmware version "x.xx.xxx" message displays, and the B450 automatically reboots.
 9. Close the Tera Term session, and re-launch Tera Term.
 10. Log back into Tera Term as described previously to re-establish communication from your laptop, to the B450.
- Communication between the control panel and B450 is restored.

6 Maintenance and troubleshooting

6.1 LED status indicators

The B450 includes the following on-board LEDs to assist with troubleshooting:

- Heartbeat (system status).
- RX (receive).
- TX (transmit).

The plug-in module also includes LEDs for troubleshooting and status.

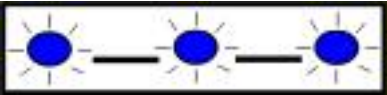
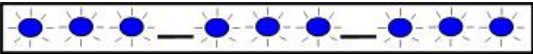
Flash pattern	Function
Flashes once every 1 sec 	Normal state. Indicates normal operation.
3 quick flashes every 1 sec 	Communication error state. Indicates a bus communication error with the control panel.
On Steady 	Trouble state. Indicates a trouble condition exists. Examine the other LEDs to determine the trouble condition.
Off 	LED trouble state. Indicates the module is not powered up, or there is a failure in the module. Check for proper installation.

Table 6.1: Heartbeat LED descriptions

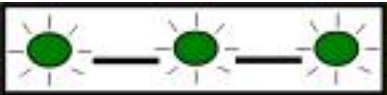
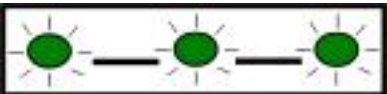
Flash pattern	Function
RX (Receive) Flashing 	Occurs every time a packet is received on-air.
TX (Transmit) Flashing 	Occurs every time a packet is transmitted on-air.

Table 6.2: RX and TX LED descriptions

Plug-in communicator LEDs

For communicator LED information, refer to the compatible communicator documentation.

Trouble condition LEDs

Condition	B450 Heartbeat	B450 Transmit (TX)	B450 Receive (RX)	Plug-in module status
Module tamper	Not indicated			
Plug-in module missing	On Steady	Off	Blink 1	N/A
Plug-in module not recognized	On Steady	Off	Blink 3	Off
Low bus voltage	On Steady	Off	Blink 4	Off
Cellular modem failure	On Steady	Off	Blink 5	Off
Switch position trouble	On Steady	Off	Blink 6	1 Hz Heartbeat
Configuration failure	On Steady	Off	Blink 7	On Steady

Table 6.3: B450 module related trouble conditions

Condition	B450 Heartbeat	B450 Transmit (TX)	B450 Receive (RX)	Plug-in module status
No IP address	On Steady	Off	Off	Blink 2
Cellular number not activated	On Steady	Off	Off	Blink 3
Not enough towers (single tower)	On Steady	Off	Off	Blink 4
Low signal strength	On Steady	Off	Off	On Steady
No towers	On Steady	Off	Off	On Steady
Detecting plug-in module type	On Steady	On Steady	On Steady	Off

Table 6.4: Plug-in module related trouble conditions

SMS configuring LEDs

Condition	B450 Heartbeat	B450 Transmit (TX)	B450 Receive (RX)	Plug-in module status
Invalid SMS message received	1 sec flash	The Transmit (TX) and Receive (RX) LEDs will alternate flashing at 1/2 second interval		1 sec flash
SMS configuration complete	1 sec flash	The Transmit (TX) and Receive (RX) LEDs will flash in unison at a 1 second interval		1 sec flash

6.2 Show the firmware version

To show the firmware version using an LED flash pattern:

- the optional tamper switch is installed:
With the enclosure door open, activate the tamper switch.
- If the optional tamper switch is NOT installed:
Momentarily short the tamper pins.

When the tamper switch is activated (open to closed), the heartbeat LED stays OFF for 3 sec before indicating the firmware version. The LED pulses the major, minor, and micro digits of the firmware version, with a 1 sec pause after each digit.

The following is an example: The version 1.4.3 would be shown as LED flashes:

[3 second pause] * _**** _*** [3 second pause, then normal operation].

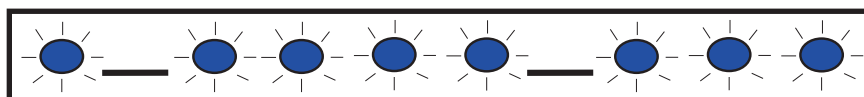


Figure 6.1: Firmware LED flash patterns example

6.3 Diagnostic log

The Diagnostic Log option is used in the event of an intermittent service outage, or communication error, in which a diagnostic log can be generated from the B450 menu options. The generated diagnostic log file is used by TECHNICAL SUPPORT to determine how often a persistent problem occurs, as well as detailed network configuration settings associated to the module during the time of the reported problem.

Generate the diagnostic log only when directed by TECHNICAL SUPPORT.

6.4 Understanding network polling

Plan carefully when programming the control panel poll time, ACK wait times, retries, and D6x00 Receiver poll and supervision time. Having the wrong or improper control panel settings could cause trouble conditions when the network carrier performs maintenance, and increased data volumes that could effect your monthly cost. Your settings for these parameters determine how the system works, but depend on the security level needed. For more information regarding proper data plans and installation parameters related to network polling, refer to *Bosch Cellular Service User Guide* (P/N: F01U273558).

6.4.1 Example 1 - High Security Application

Polling times are typically less than 20 min. Path integrity is critical, and short interruptions in network service are indicated at the premise and central station. The following High Security Application recommendation assumes the B450 is the primary communication device with no backup.

Control panel settings

- Poll Rate: 240 sec
- ACK Wait: 10 sec
- Retry Count: 5

**Notice!**

For high supervision rates on high latency networks, the ACK Wait can be increased to 15 seconds with a Retry Count of 3 to allow extra time for acknowledgements.

D6x00 receiver settings

- Poll rate-supervision time: 300 sec

6.4.2 Example 2 - Medium Security Application

Polling times are typically 1 to 4 hours. Path integrity is important, and short interruptions in network service might be indicated at the premise and central station. The following Medium Security Application recommendation assumes the B450 is the primary communication device with no backup.

Control panel settings

- Poll Rate: 12600 sec (3.5 hours)
- ACK Wait: 300 sec (5 min)
- Retry Count: 5

D6x00 receiver settings

- Poll rate-supervision time: 4 hours

6.4.3 Example 3 - Backup or Low Security Application

Polling times are typically 12 to 24 hours. Path integrity is only tested once or twice a day, and short interruptions in network service are generally not indicated at the premise and central station. Using settings similar to the following allows the system to recover from short outages without causing trouble conditions at the premise. The following Backup or Low Security Application recommendation assumes the B450 is the primary or backup communication device.

Control panel settings

- Poll Rate: 65535 sec (24 hours)

**Notice!**

65535 is used in the GV3 and GV4 Series control panels to program 24 hours.

- ACK Wait: 300 sec (5 min)
- Retry Count: 10

D6x00 receiver settings

- Poll rate-supervision time: 25 hours

6.5 Control panel programming using cellular

For more information regarding proper planning and installation parameters related to VPN setup for control panel programming, refer to *Bosch Cellular Service User Guide* (P/N: F01U273558).

7 Specifications and certifications

7.1 Technical specification

Environmental considerations

Relative humidity	Up to 93% non-condensing
Temperature (operating)	0° - +49° C (+32° - 120° F)

Properties

Dimensions (HxWxD)	79 mm x 128 mm x 38 mm (3.11 in x 5.03 in x 1.50 in)
--------------------	--

Power requirements

Current	Standby: B450 with B440/B441 = 60 mA Alarm: B450 with B440/B441 = 180 mA
Voltage	(B450 bus operation): 12 VDC nominal

Wiring

Data bus wire gauge	12 AWG to 22 AWG
Data bus wire length	Maximum distance – Wire size : 22 AWG (0.65 mm) --> 12 m (40 ft) 18 AWG (1.0 mm) --> 30 m (100 ft) 16 AWG (1.3 mm) --> 48 m (158 ft) 12 AWG (2.0 mm) --> 122 m (400 ft) Using a separate UL listed power supply, such as the B520 Auxiliary Power Supply Module, connected to the B450 within the specification listed above, the wire distance can be extended up to 300 m (1000 ft)
USB cable	Type A male-to-male

Compatible enclosures

B10 – 35.6 cm x 31.8 cm x 7.6 cm (14 in x 12.5 in x 3 in)
B11 – 27.8 cm x 25.9 cm x 8.32 cm (10.9 in x 10.2 in x 3.3 in)
D8103 – 41 cm x 41 cm x 9 cm (16 in x 16 in x 3.5 in)
D203 – 19.68 cm x 13.05 cm x 6.35 cm (7.75 in x 5.14 in x 2.50 in)



Notice!

Temporary loss of communication may be caused by static when using anyone of the above enclosures.

Compatible control panels

B5512/B4512/B3512
D9412GV4/D7412GV4 v2.00
D9412GV4/D7412GV4 v1.00.0xx
D9412GV3/D7412GV3/D7212GV3
FPD-7024 (v1.03+)

7.2**Certifications**

Region	Certification
US	NIST FIPS 197
	FCC Part 15 Class B
	UL 365 – Police Station Connected Burglar Alarm Units and Systems
	UL 636 – Hold Up Alarm Units and Systems
	UL 864 – Control Units and Accessories for Fire Alarm Systems
	UL 985 – Household Fire Warning System Units
	UL 1023 – Household Burglar Alarm System Units
	UL 1076 – Proprietary Burglar Alarm Units and Systems
	UL 1610 – Central Station Burglar Alarm Units
	SIA CP-01:2010 False Alarm Reduction

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